Serial No.: 10/017,418
Attorney Docket No.: 10541-794

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3679

Examiner: Kenneth L. Thompson

Inventors: Douglas J. Bradley
Brian E. Carlson

Serial No.: 10/017,418

Filing Date: December 14, 2001

Title: Integrally Stiffened Composite Drive Shaft

DECLARATION OF INVENTOR

UNDER 37 C.F.R. §1.131

Commissioner for Patents
U.S. Patent and Trademark Office
Washington, DC 20231

Dear Sir:

We, Douglas J. Bradley and Brian E. Carlson, hereby declare that:

1. We are the co-inventors of the invention claimed and described in the above-identified application.

2. Prior to March 20, 2001, we conceived said invention in the subject application in the United States, as evidenced by the Invention Disclosure form (dates redacted) which is attached as Exhibit A.

3. Prior to November 1, 2000, we reduced to practice said invention in the subject application in the United States, as evidenced by the "Date of Completion" (date redacted) found in the Invention Disclosure form which is attached as Exhibit A.

3. Said Invention Disclosure form was completed and submitted prior to November 1, 2000.

4. That all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statement may jeopardize the validity of the above-identified application, and any patent issuing thereon or any patent to which this declaration is direction.

Dated: 2/5/04

Douglas J. Bradley

Dated: 2/5/04

Brian E. Carlson

BEST AVAILABLE COPY

Online Invention Disclosure: View Invention Disclosure

Inv. Discl. Docket No: V200-0749
Creation Date: [redacted]
Approval to submit was given by: BCARLSON: DBRADLE6[redacted]

Section 1: INVENTION DESCRIPTION

Title of Invention: INTEGRALLY STIFFENED COMPOSITE DRIVE SHAFT
Patent Evaluation Committee: SVC
CPSC Code: 05.00.00
Originating Country Code: US
Related Disclosure(s): None

Section 2: PROBLEM & SOLUTION

Description or Comments: Problem & Solution: Advanced composite shafts offer improved performance over steel, aluminum, and metal matrix composite shafts in angular speed sensitive and bending critical applications. Advanced composite shafts are also less expensive when length/speed ratios necessitate a center support bearing. This concept results in a more efficient composite shaft by geometrically increasing the bending moment of inertia via ribs, hat stiffeners, "T" sections, etc. to be molded into the shaft. The result of these features is a significant increase in the moment of inertia with minimal increase in material.

Attachment: See Section:9 ATTACHMENTS

Section 3: PRIOR ART

Description or Comments: Patent no. Holder Concept Remarks 5,127,975 Dana Pultruding composite driveshaft over aluminum w/ plugs XXX Dana End caps for pultrusion 5,253,947 GKN Metal journal plastically deformed/bonded to composite tube 5,724,715 Addax Composite Flange for

EXHIBIT A

GKN Metal journal plastically deformed/bonded to composite tube 5,724,715 Addax Composite Flange for driveshafts Adhesively Bonded flange (not integral)

Attachment: See Section:9 ATTACHMENTS

Section 4: NEW TECHNOLOGY

Description or Comments:

Attachment: See Section:9 ATTACHMENTS

Section 5: DETAILED DESCRIPTION

Description or Comments: An integrally stiffened shaft is fabricated by wrapping fibrous reinforcement (prepreg or dry) around a bladder/mandrel. These mandrels could be of various shapes, hat stiffeners, circular, "T" sections, etc., and are then placed into a mating mold. These pieces could also be pre cured or pultruded pieces, or another material (metallic or other). The mating mold cavities are geometrically similar so as to maintain rotational balance. Once the bladder/mandrel sections are placed into the mating tool, more fibrous material/prepreg is wrapped around the whole tool via prepreg wrapping, pultrusion, filament winding, etc. Liquid/film infusion techniques could also be utilized to impregnate dry fiber forms. Then the assembly is consolidated via shrink wrap, female tool, die, or free standing and cured. A composite material "kit", consisting of dry fiber or prepreg, could also be prepared which has plies and mandrels preshaped. This kit could then be wrapped around a mating mandrel and cured. After material consolidation and cure, the mandrels could be removed and reused or left in the part. Near the ends of the shaft, material could either be removed and end fittings bonded, or integral flanged end fittings could be incorporated. End fittings could also be cured in place.

Attachment: See Section:9 ATTACHMENTS

Section 6: DATES

Record(s) of Completion: [redacted]

Date of Completion:

First Production Use: [Model and Date] drive shaft:

Section 7: CATEGORY QUESTIONS

Invention Category: Process

Category Questions do not exist or not answered.

[redacted]

Section 8: MISCELLANEOUS ITEMS

Is it a Government Contract?: No

If yes, Government Contract Number:

Identify a government agreement, partnership, consortium, or other company involved with conception or first building of the invention:

If disclosed to non-Company personnel, identify recipient and date:

Section 9: ATTACHMENTS

File Name Click on File Name to view and print it.	Description
18209Detail_Description.doc	Your original attachment file : IntegrallyStiffenedCompositeShaft.doc was renamed.

Section 10: INVENTORSHIP

CDS or Other Id:	BCARLSON
Last Name:	Carlson
First Name:	Brian
Middle Name:	Eric
Employment Category:	S
Employment Status:	A
Job Title:	Supervisor Adv. Mfg.
Email:	[redacted]
Office Phone Number:	
Fax:	
Social Security or Company ID Number:	[This field is blocked out intentionally.]
Citizenship:	US
Home Address Line 1:	[redacted]
Home Address Line 2:	
City, State & Zip Code:	[redacted]
Country Code:	
Employee of:	Visteon Corporation
Department:	B610
Organization Code:	CD1110BE-
Payroll Location Code:	4243
Office Address:	VISTEON CHASSIS SYSTEMS, SW61-044
Maildrop:	
Supervisor's CDS Id:	
Manager's CDS Id:	FKIENER

[redacted]

CDS or Other Id:	DBRADLE6
Last Name:	Bradley
First Name:	Douglas
Middle Name:	James
Employment Category:	S
Employment Status:	A
Job Title:	Composite Engineer
Email:	[redacted]
Office Phone Number:	
Fax:	
Social Security or Company ID Number:	[This field is blocked out intentionally.]
Citizenship:	US
Home Address Line 1:	[redacted]
Home Address Line 2:	
City, State & Zip Code:	[redacted]
Country Code:	US
Employee of:	Visteon Corporation
Department:	B610
Organization Code:	CD1110BE
Payroll Location Code:	4243
Office Address:	VISTEON CHASSIS SYSTEMS, SW61-027
Maildrop:	SW61-027
Supervisor's CDS Id:	bcarlson
Manager's CDS Id:	rkean

[redacted]

Concept and Manufacturing Method for Integrally Stiffened Composite Shaft

Sect. 2: Problem & Solution

Advanced composite shafts offer improved performance over steel, aluminum, and metal matrix composite shafts in angular speed sensitive and bending critical applications. Advanced composite shafts are also less expensive when length/speed ratios necessitate a center support bearing.

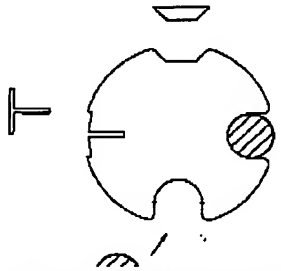
This concept results in a more efficient composite shaft by geometrically increasing the bending moment of inertia via ribs, hat stiffeners, 'T' sections, etc. to be molded into the shaft. The result of these features is a significant increase in the moment of inertia with minimal increase in material.

Sect. 3: Prior art

Patent no.	Holder	Concept	Remarks
5,127,975	Dana	Pultruding composite driveshaft over aluminum w/ plugs	
XXX	Dana	End caps for pultrusion	
5,253,947	GKN	Metal journal plastically deformed/bonded to composite tube	
5,724,715	Addax	Composite Flange for driveshafts	Adhesively Bonded flange (not integral)

Sect. 4: Detailed Description

An integrally stiffened shaft is fabricated by wrapping fibrous reinforcement (prepreg or dry) around a bladder/mandrel. These mandrels could be of various shapes, hat stiffeners, circular, 'T' sections, etc., and are then placed into a mating mold. These pieces could also be pre cured or pultruded pieces, or another material (metallic or other). The mating mold cavities are geometrically similar so as to maintain rotational balance.



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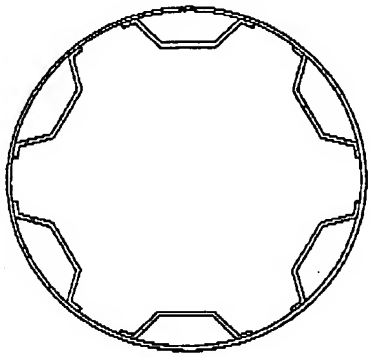

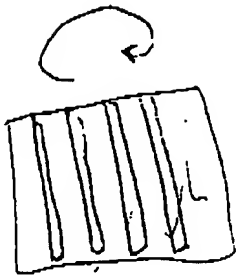

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